

APPENDIX A
SI SAMPLE PLAN (EXAMPLE)

This appendix provides an example of a sample plan for an SI at a fictitious site, following the form and content discussed in Section 3.6.2. Note that this guidance example does not include complete references, such as applicable SOPs and SOGs, an equipment list, or a site specific health and safety plan and IDW plan.

SITE INSPECTION SAMPLE PLAN
PALMETTO LANDFILL

PALMETTO COUNTY, SOUTH CAROLINA
EPA ID NO. SCD123456789

Prepared Under TDD No. Y9-87912-43
Contract No. 99-99-9999

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Figure 1 - Sample Locations: Source, Surface Water Sediment, and Soil

Figure 2 - Sample Locations: Ground Water

ATTACHMENT A - Health and Safety Plan [omitted]

ATTACHMENT B - Equipment List [omitted]

ATTACHMENT C - Applicable Standard Operating Guidelines [omitted]

ATTACHMENT D - Drinking Water Well Survey [omitted]

1. INTRODUCTION

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA), the U.S. Environmental Protection Agency (EPA), Waste Management Division, Region 4 will conduct a focused site inspection (SI) at the Palmetto Landfill in Palmetto County, South Carolina. The focused SI will investigate the threat to human health and the environment posed by the site (Reference 1). The scope of the investigation will include collecting source samples to determine types and concentrations of hazardous substances onsite and collecting media samples to investigate migration of hazardous substances from the site.

2. SITE DESCRIPTION

2.1 Location

Palmetto Landfill is located at 6250 Palmetto Drive in rural Palmetto County, South Carolina, 1.5 miles east of Angleton (Figure 3). The geographic coordinates are 18 E28'43" N latitude and 66 E07'33" W longitude [sic] (Reference 2). To reach the site, travel east from Angleton approximately 0.25 mile from the intersection of Rt. 149 and Palmetto Drive.

The climate of Palmetto County is characteristically temperate; summers are warm and humid with daily temperatures reaching 90 E F or higher, and winters are generally mild with daily average temperatures 55 E to 60 E F. Mean annual rainfall is 46 inches, while net precipitation is 10.87 inches (Reference 3, pp. 7, 10).

2.2 Site Description/History

The landfill property covers approximately 10 acres, approximately 6 acres of which were used for disposal of wastes (Reference 4). The property is located on flat terrain that slopes toward the northeast boundary (Reference 5) and Wildlife Creek, a small, slowly flowing stream (Reference 6, p. 124). The landfill property is rectangular and bordered on three sides by a ditch constructed to intercept ground water upgradient of the site and divert it around the buried wastes (Reference 4). Since the ditch is 8 to 10 feet deep, it does not fulfill this function entirely as it does not completely transect the aquifer. However, it does create a barrier to runoff from areas upgradient of the site. Vegetation is stressed along the banks of the ditch (Reference 5). Water in the ditch is an orange-brown color and is oily in appearance (Reference 5; Reference 7, p. 4). No buildings or other structures are on the property. The property is surrounded by an electric chain link fence in good condition, and there is a locked entrance gate across the access road to the facility (Reference 5; Reference 7, p. 3).

2.3 Operational History and Waste Characteristics

Smith and Moore Disposal Services, 1111 Main Street, Angleton, South Carolina, owns Palmetto Landfill. The landfill opened in April 1970 for disposal of municipal garbage and household debris. Wastes were deposited in ditches 7 to 10 feet deep and covered with soil at the end of each day. Beginning in October 1978, the landfill accepted industrial wastes on a limited basis. Smith and Moore kept no formal records of the amounts and types of wastes received. The landfill did receive a one-time shipment of approximately 500 gallons of trichloroethene (TCE) waste (Reference 4). Landfilling operations were discontinued in July 1980 when the landfill reached capacity. A 2-foot soil cover was placed over the entire landfill (Reference 4).

Palmetto Landfill operated under permit number 999-999 issued by the South Carolina Department of Health and Environmental Concerns [sic] (SCDHEC). SCDHEC personnel inspected the landfill to verify the closure

met the permit requirements. SCDHEC personnel have inspected the landfill several times at irregular intervals. To date, there has been no sampling or response action at Palmetto Landfill (Reference 8).

3. COLLECTION OF NON-SAMPLING DATA

Non-sampling data collection activities will include verifying population and environmental information as well as new information. The integrity of the landfill cover and location of wetlands will be verified by visual inspection. The SI will investigate if either of two Federal endangered species, the Bald Eagle and the Salt Marsh Harvest Mouse, which have critical habitats in Palmetto County, lives onsite. A drive-by survey will be performed to confirm the locations of private wells in the area and a well system questionnaire will be distributed to persons using private wells. Additional data will be gathered as necessary from the office.

4. SAMPLING ACTIVITIES

The objectives of the SI are to collect analytical data to identify hazardous substances at the site and investigate whether hazardous substances have been released to the environment and whether the substances have impacted human health and the environment. The plan (Figure 1) calls for waste source, surface water sediment, ground water, and soil samples. The SE Regional Contract Laboratory in Tallahassee will perform full TCL analysis of all samples.

4.1 Source Sampling

Sources will be sampled where breaches in the landfill cap and a leachate seep were identified during the PA. These locations were chosen to identify hazardous substances at the site. Waste samples will include black sludge-like material from a small depression in the landfill cap near the center of the site, a sample from an area of stressed vegetation northeast of the depression, and a leachate sample from the perimeter ditch east of the landfill. A duplicate leachate sample will be collected from the perimeter ditch.

4.2 Ground Water Sampling

Ground water samples will be taken from the six residential wells hypothesized as primary targets during the PA. These samples will test whether hazardous substances have been released to the ground water and whether the release has impacted drinking water wells.

4.3 Surface Water Sampling

Surface water samples will be taken to determine whether a release to surface water has occurred and whether the release has impacted the fishery in Wildlife Creek, wetlands along its banks, and habitats of endangered species associated with the creek. During the PA, the fishery, wetlands, and sensitive environments were evaluated as primary targets. One sediment sample will be taken at each drainage point of entry to Wildlife Creek (fishery), at the section of wetland closest to the site, and at an area in the wetland approximately 500 feet downstream from the first sample. Depending on location of endangered species habitats, it may be necessary to alter this plan. Two background sediment samples will be collected upstream of the probable points of entry to Wildlife Creek north of the site.

4.4 Soil Sampling

A soil sample will be collected offsite, 1500 feet from the landfill. A soil sample will be taken on the property of the nearest residence to investigate if it is affected by the site.

4.5 Quality Assurance

Quality assurance and quality control (QA/QC) for this sampling event will be provided by a combination of field blanks and duplicates. One aqueous field blank will be taken during ground water sampling to test for contamination possibly introduced by sample containers and preservatives. One duplicate sample each will be taken from the nearest well, the downstream entry to Wildlife Creek (fishery), and the leachate. Duplicate samples will test the reliability of sampling procedures and results.

All sample collection, preservation, QA/QC preparation of field blanks and duplicates, and chain-of-custody procedures used during sampling activities will be in accordance with the standard operating guidelines (SOGs) specified in the *Engineering and Support Branch Standard Operating Procedures and Quality Assurance Manual*, U.S. Environmental Protection Agency, Environmental Services Division, Region IV, Atlanta, Georgia, April 1986.

4.6 Field Activities

Field personnel are scheduled to travel to the site on September 3, 1991. EPA Region 4 has requested access to the facility September 4. Residents with private wells to be sampled have been requested to provide access to sampling personnel on September 4. All environmental samples and non-sampling information will be collected in one day. Field personnel are scheduled to leave the site the morning of September 5.

Field work will begin with a site reconnaissance in the morning to verify that planned sample locations are appropriate and accessible. During the reconnaissance, ambient air will be monitored with OVA and HNu meters. Radiation screening will be conducted during the site reconnaissance with a Victoreen Radiation Detector and Mini-Alert according to EPA SOG No. 18, Revision 0. A drive-by survey will verify the location of wetlands, the closest resident, private well users, and the population within approximately 0.25 mile of the site. If necessary, original plans will be modified. Upon collection, all samples will be prepared and packaged for shipping.

Two 2-person teams will be deployed. Sampling will start after the original sample plan and any necessary modifications are confirmed. Proposed sample locations are shown in Figures 2 and 3.

The ground water sampling team will visit each residence to obtain an unfiltered sample (none of the residences have filter treatment) from the spigot nearest the well. Each resident will be asked to complete a well system questionnaire regarding well depth, persons per household, etc. (Attachment D). This team also will collect a soil sample from the residential property 300 feet from the site. Since this residence is also the location of a private well, both soil and ground water will be sampled during the same visit. Soil samples will be collected 6 to 12 inches below ground surface according to EPA SOG No. 10, Revision 0, and placed in an unpreserved 4-ounce container.

The second sampling team will collect surface water sediment samples according to EPA SOG No. 10a, Revision 0, starting with the most downstream sample and proceeding upstream. Sediment samples will be collected with a disposable scoop from an area of slow flow; a portion of the collected material will be placed into a sterile container.

After completing the surface water sampling, the second team will collect waste source samples in the following order: 1) an aqueous sample from the east perimeter ditch, 2) a sediment sample of the sludge-like material in the landfill cap depression, and 3) a soil sample from the area of stressed vegetation.

The surface water sample will be collected by submerging a sterile container below the surface of the water, according to EPA SOG No. 9, Revision 0. Surface water samples to be analyzed for organics will be collected in 44-ml septum vials and preserved with 100 microliters of 7,000 ppm mercuric chloride solution to a final concentration of 16 ppm. The surface water sample for inorganic analysis will be collected in a 4-ounce polyethylene container, filtered, and preserved with nitric acid to a pH of less than 2.0.

4.7 Quality Control Procedures

All sampling equipment will be decontaminated between sample locations according to EPA SOG No. 23, Revision 0, and sample containers will be rinsed with deionized water. All samples will be stored in coolers on ice until they reach the laboratory. Chain of custody will be maintained according to EPA SOG No. 21, Revision 0 by field personnel until samples are handed over to the SE Regional Contract Laboratory in Tallahassee,

5. INVESTIGATION-DERIVED WASTES PLAN

Investigation-derived wastes include personal protective equipment, disposable sampling equipment, purged ground water, and soil not collected as a sample. Personal protective equipment and disposable sampling equipment (DE) will be decontaminated and rendered nonhazardous. All dry personal protective equipment and DE will be double-bagged and deposited offsite at the EPA Region 4 warehouse.

Purged ground water is expected to be nonhazardous under the Resources Conservation and Recovery Act (RCRA). Per signed agreements with owners of the off-site wells to be sampled, ground water will be poured onto the ground next to the wells and allowed to infiltrate. Any quantities of soils that are not collected as samples will be spread around the sample location and covered with surficial soil. These soils are anticipated to be RCRA nonhazardous. Any sediments not collected as samples will be returned to the surface water.

6. PROJECT MANAGEMENT

The project manager for the Palmetto Landfill SI, Joseph Brown, will schedule field activities and personnel requirements, verify site access authority obtained through the EPA Project Officer, direct and oversee all onsite and offsite activities associated with the investigation. The project manager also will document and manage all collected samples. The project safety officer is Joan Locke. Max Villeroy, Wanda Grouper, and A.J. Hoyt will collect and prepare samples and support all other field operations as required. The estimated technical hours total 440 (Table 2). Twenty-one proposed CLP samples are summarized in Table 1.

6.1 Field Equipment/Health and Safety

Safety monitoring equipment will include OVA, HNu, Victoreen Radiation Detector, and TLD badge. Field respiratory protection will be level C during the site reconnaissance. If non-methane contaminants and radiation levels are safely below background and action levels, the reconnaissance will continue at level D. Protection during SI onsite sampling activities will begin at level D; if radiation and volatile contaminants are detected, sampling will continue at level C. Offsite sampling will be conducted at level D protection. Field dress for reconnaissance will include slush boots, Tyvek 1422A, disposable gloves, and hardhat. For onsite sampling, butyl or nitrile gloves will be worn over the disposable gloves, and the hardhat will include a faceshield. Field dress for offsite sampling entails regular cotton work clothes, work boots, and disposable gloves. Other items required for this investigation include sample containers and sampling tools, deionized water rinse, alconox wash, and decontamination assembly. (See Attachment B for more specific information).

6.2 Community Relations

The local community has been made aware of the date of the SI field activities. Community relations have progressed smoothly thus far.

6.3 Project Schedule

The project is expected to start in early June 1991 and end by January 31, 1992. Non-sampling data collection will begin in June and continue through late October. The SI field work will take place in early September. When the field tasks are completed, preparation of the draft SI report will begin. Analytical results will be validated by the middle of December, and the final SI report and HRS score will be completed by the end of January.

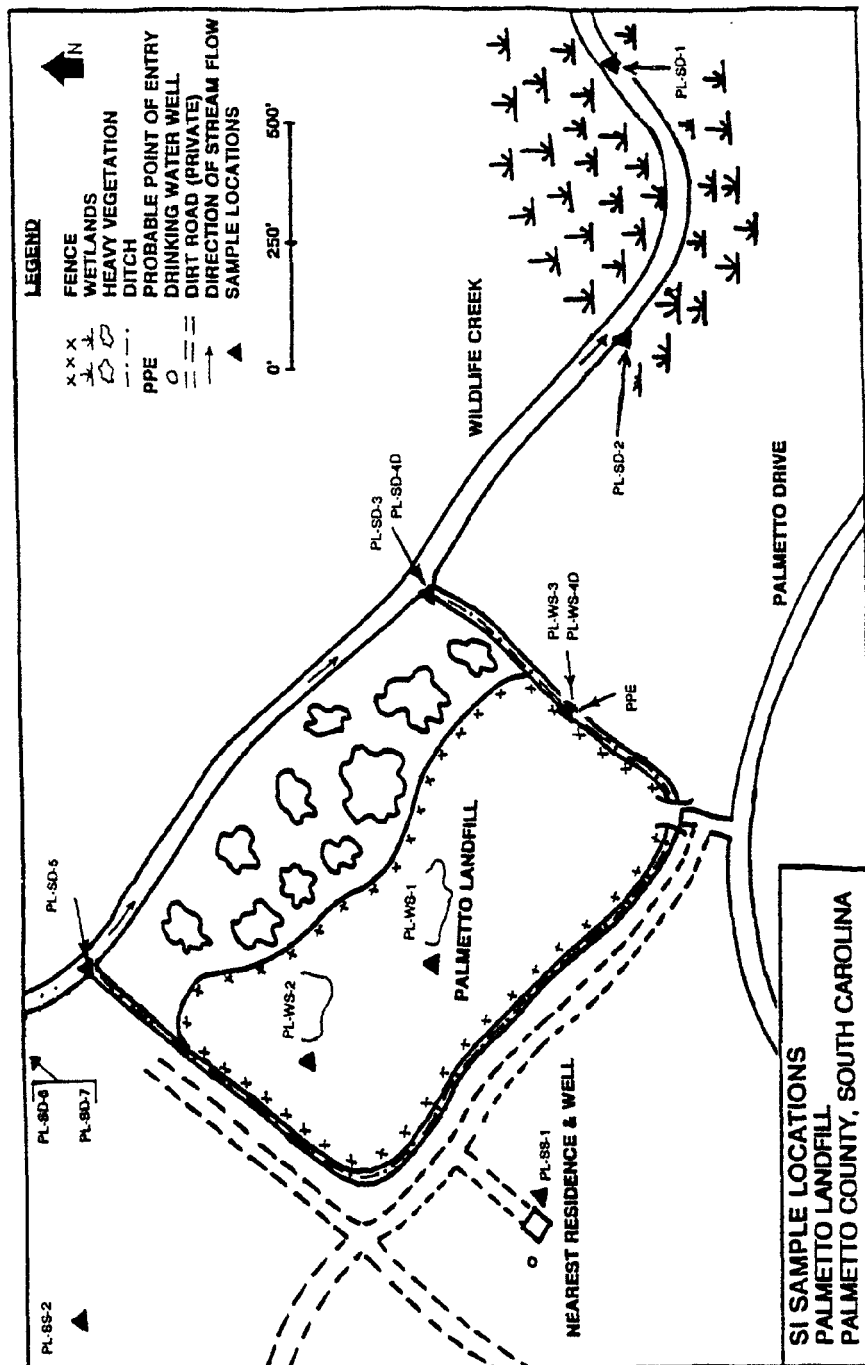
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6. A.P. Park, The Surface Water Resources of Palmetto County, South Carolina. South Carolina Water Resources Commission Report No. 101B.
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TABLE 1: PROPOSED SAMPLES

PURPOSE	SAMPLE	LOCATION AND OBJECTIVE
Ground Water	PL-GW-1	Well 300' S of landfill, determine presence/absence of hazardous substances
	PL-GW-3	Well 1200' SE of landfill, determine presence/absence of hazardous substances
	PL-GW-4	Well 1200' NE of landfill, determine presence/absence of hazardous substances
	PL-GW-5	Well 1000' N of landfill, determine presence/absence of hazardous substances
	PL-GW-6	Well 1200' N of landfill, determine presence/absence of hazardous substances
	PL-GW-7	Well 1200' N of landfill, determine presence/absence of hazardous substances
QA/QC	PL-GW-8	Field blank for detection of contaminated vials or preservatives or errors in sampling protocol
	PL-GW-2D	Duplicate of PL-GW-1
Surface Water Sediment	PL-SD-1	500' downstream of PL-SD-2 to determine presence/absence of hazardous substances in wetland and establish frontage of contaminated wetland
	PL-SD-2	Most upstream portion of wetland to determine presence/absence of hazardous substances in wetland
	PL-SD-3	NE intersection of drainage ditch and Wildlife Creek to determine presence/absence of hazardous substances in fishery
	PL-SD-5	NW intersection of drainage ditch and Wildlife Creek to determine presence/absence of hazardous substances in fishery
	PL-SD-6	100' upstream of the PPE into creek to determine presence/absence of hazardous substances
	PL-SD-7	200' upstream of the PPE into creek to determine absence of hazardous substances
QA/QC	PL-SD-4D	Duplicate of PL-SD-3
Soil	PL-SS-1	From nearest residential property 300' SW of landfill at depth of 1.5' to determine if hazardous substances from the site are on residential property
	PL-SS-2	Native soil 1500' NW of landfill to represent background conditions
Waste Sources	PL-WS-1	Waste sample at depth of 0.5' from landfill depression to determine types and concentrations of hazardous substances onsite
	PL-WS-2	Soil from area of stressed vegetation at depth of 0.5' to determine types and concentrations of hazardous substances onsite
	PL-WS-3	Leachate from east side of ditch to determine types and concentrations of hazardous substances onsite; also to detect observed release to surface water
QA/QC	PL-WS-4D	Duplicate of PL-WS-3

FIGURE 1: SAMPLE LOCATIONS
Source, Surface Water Sediment, and Soil



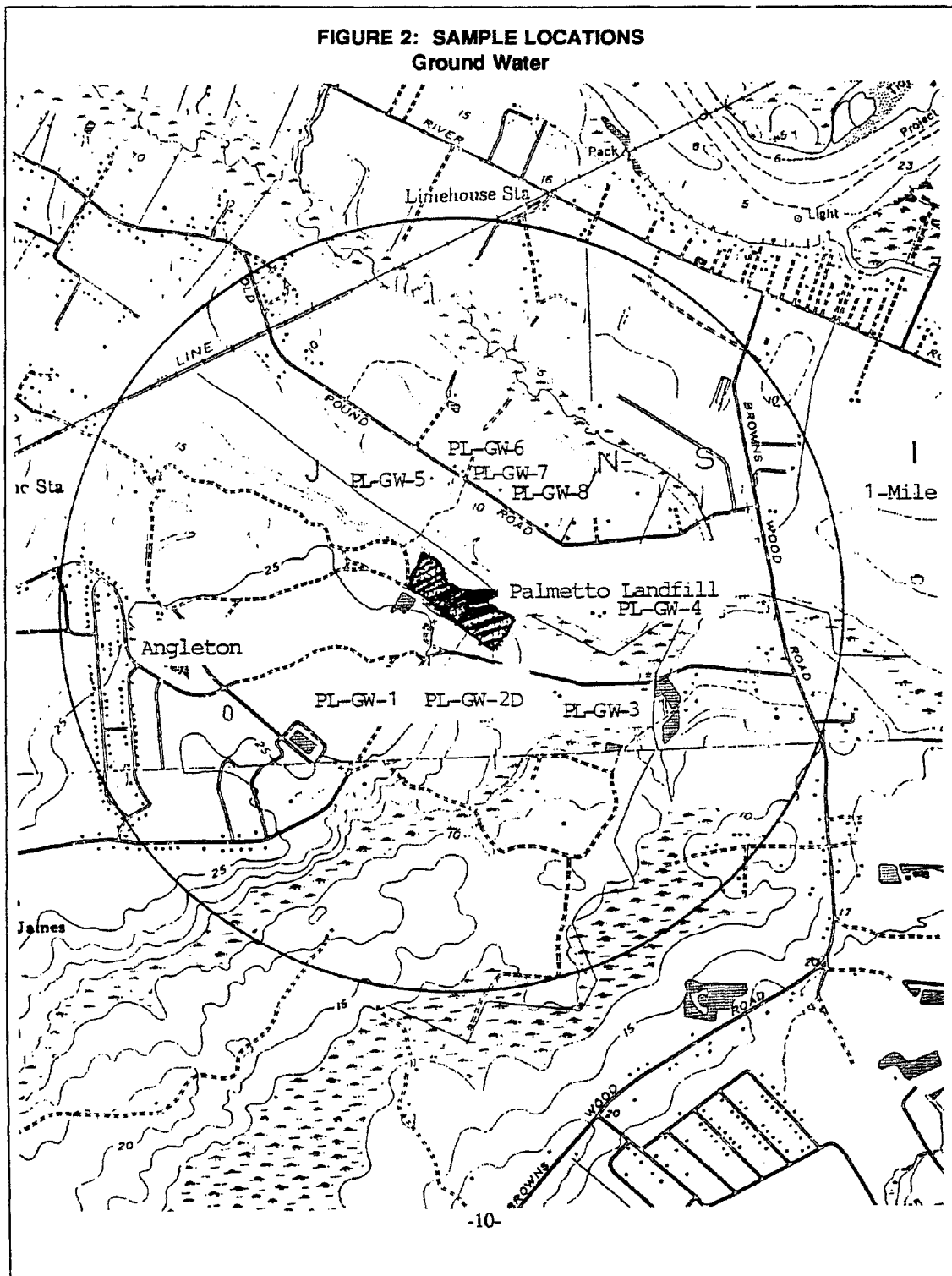


Table 2: COST SUMMARY

TASK	ESTIMATED TECHNICAL HOURS	COST (@ \$___ per hour
Review Pa and supporting materials	30	—
Prepare SI workplan	50	—
Obtain access; make advance arrangements	20	—
Collect site information from office	40	—
Travel to and from site and perform field work	150	—
Complete information gathering	30	—
Evaluate sample results	40	—
Prepare SI report and evaluate site score	80	—
CLP analysis: 21 samples (17 environmental, 3 duplicates, 1 field blank)		\$25,200
TOTAL	440	\$——